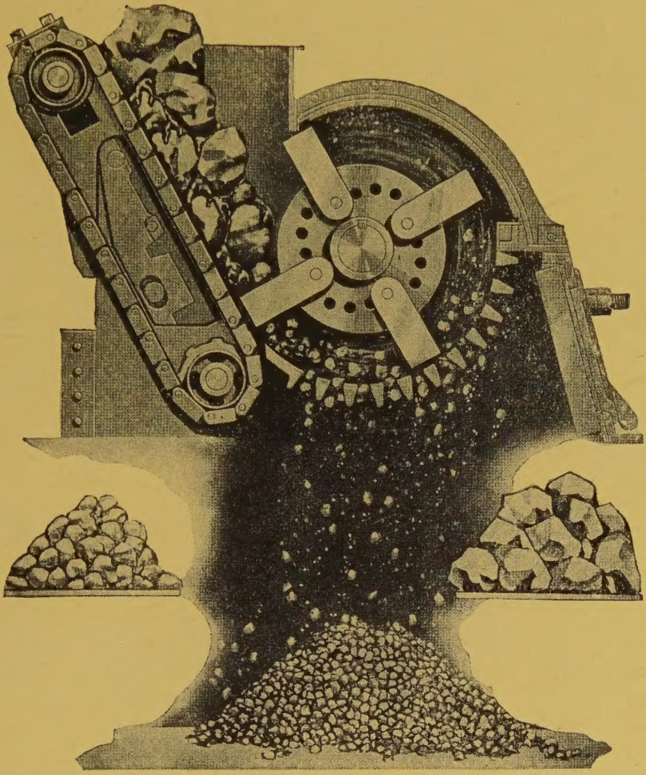
MILL SECTION of

Concrete



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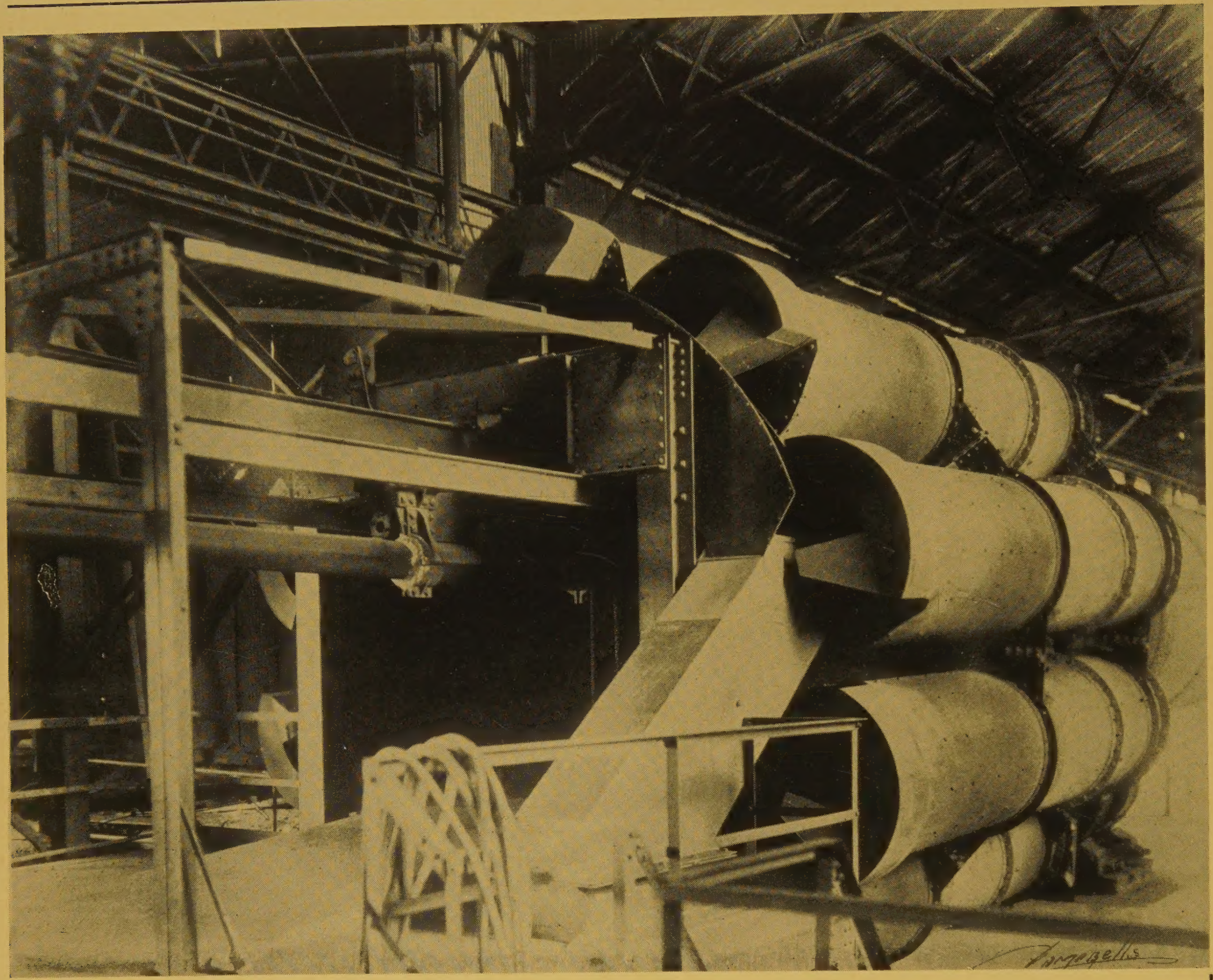

UNAX COOLER

(Patented)

For Rotary Kilns

F. L. SMIDTH & CO.

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MILL SECTION of

Concrete

The Cement Mill Edition of Concrete is edited exclusively for those interested in the manufacture of cement. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Cement Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition. The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

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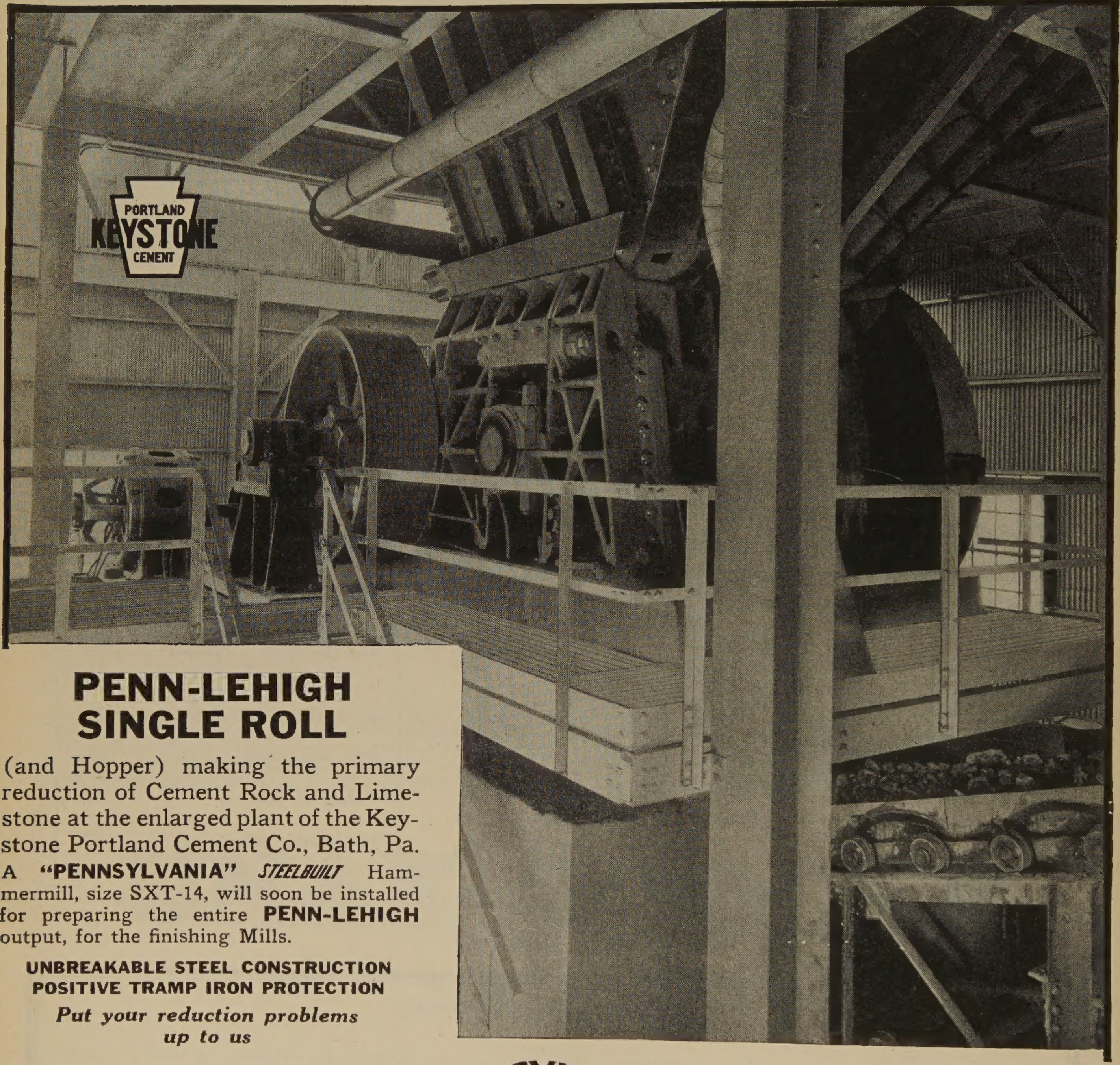

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MILL SECTION of

Concrete

Vol. 36 Chicago, January, 1930 No. 1

Glens Falls Modernizes *to Make* High Early Strength Cement

Latest of Long Series of Improvements Equips the Glens Falls Portland Cement Company's Plant for Making "Velo" Cement — A Description of the Improvements Made

A cement plant is never complete. Always as new developments in equipment and processes are brought about, the plant must be changed and brought up to the minute.

The history of the Glens Falls Portland Cement Co.—one of the oldest plants in the United States—is one of continual rebuilding and modernization. When the plant was taken over by Mr. Bayle, away back in the early days of portland cement making, he set about installing the newer types of equipment as they became available. The original kilns gave way to batteries of Schoffer kilns. These in turn were razed to make way for rotary kilns. The plant was switched from the dry process to the wet process of manufacture, and finally it was equipped to provide the high early strength cement now demanded.

It is this latest change that is described in the following article—The Editors.

By H. A. SCHAFFER

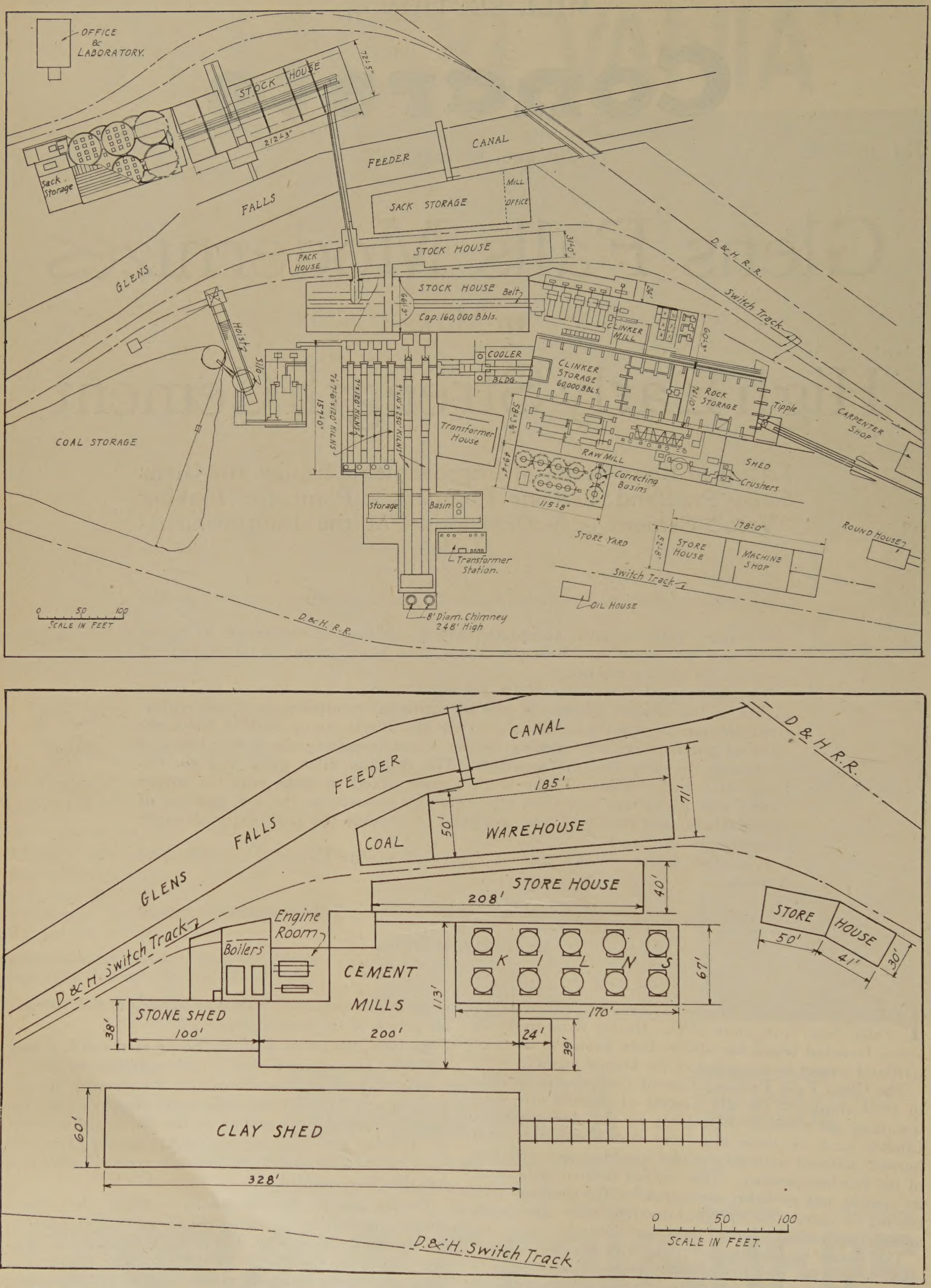
PORTLAND cement has been manufactured at Glens Falls, New York, since 1893. During those thirty-six years, Ironclad brand has always been known to users of portland cement as a product of the highest quality.

The Glens Falls Portland Cement Company from 1893 to 1924 employed the dry process of manufacture, first installing 10 vertical shaft kilns of the Aalborg type. Clinker made in these kilns was sorted and only well burned material selected for the crushing and grinding of the finished product. This method insured good quality cement and probably accounted for the company continuing to operate the upright kilns long after other early manufacturers had adopted the rotary kiln.

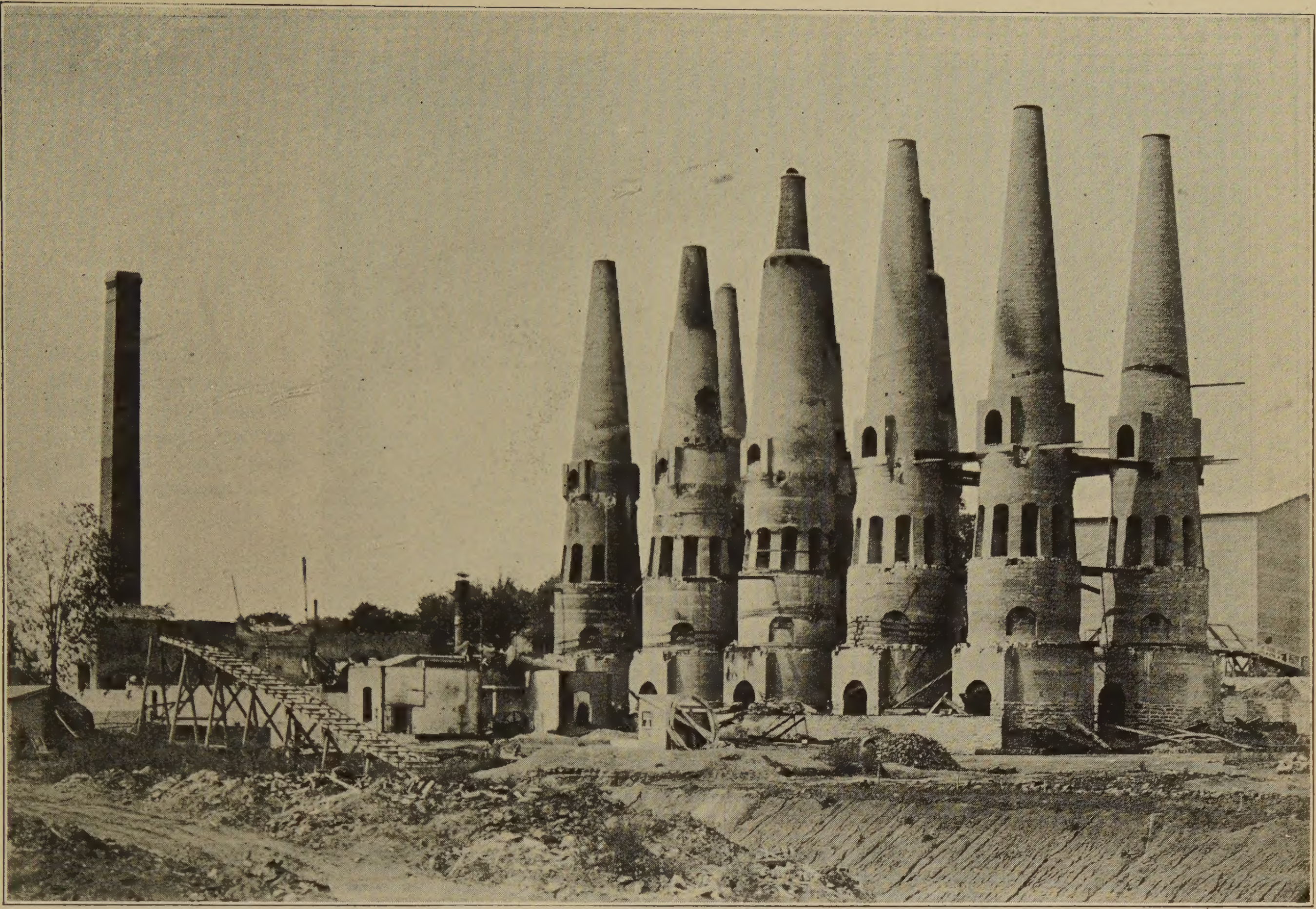
The desire to furnish the trade with the best cement possible and the inability of many rotary kiln cements to meet certain requirements, fully justified the continuance of the older and safer method of burning at that particular period of the cement industry.

By 1905, the rotary kiln was firmly entrenched, it having been demonstrated that a uniformly burned clinker could be produced, thus eliminating the necessity of sorting properly burned from under-burnt clinker. This condition permitted the handling of the discharged material by elevating and conveying machinery, thereby saving the hand labor of the sorting process. Its economical success was therefore established.

Feeling assured that the quality of the product would not be impaired by the change in the method of burning, the company employed F. L. Smidth & Company to engineer two rotary kilns 7 by 120 ft. and install new machinery in the raw and clinker grinding departments.

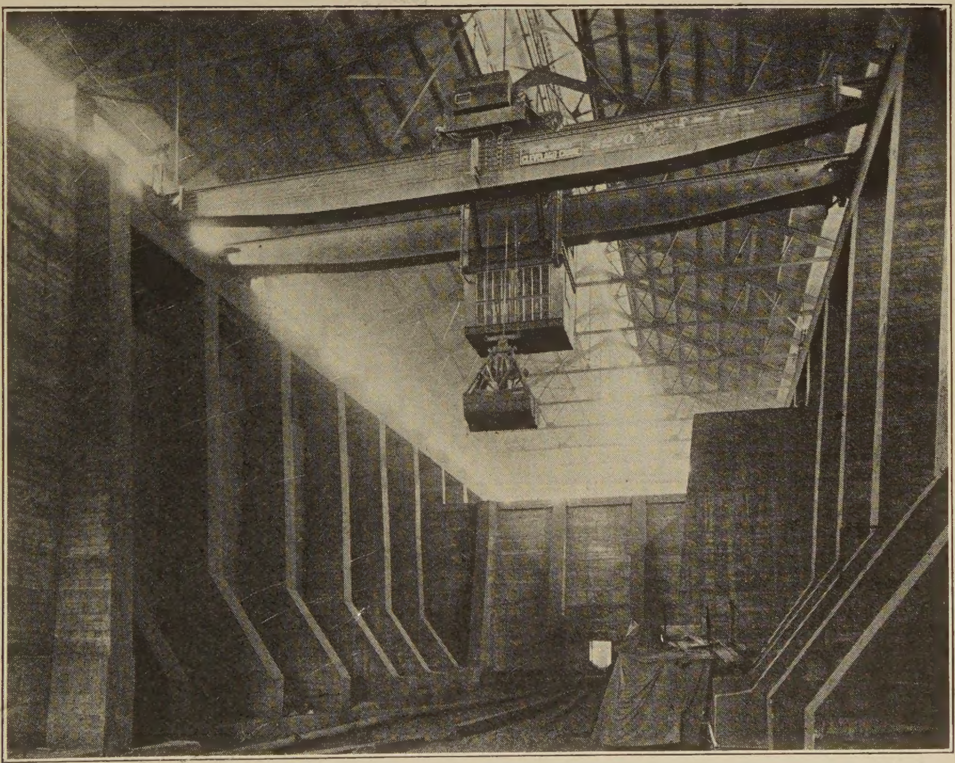


Above, the present plant layout of the Glens Falls Portland Cement Co. plant, and below, the layout previous to the installation of rotary kilns

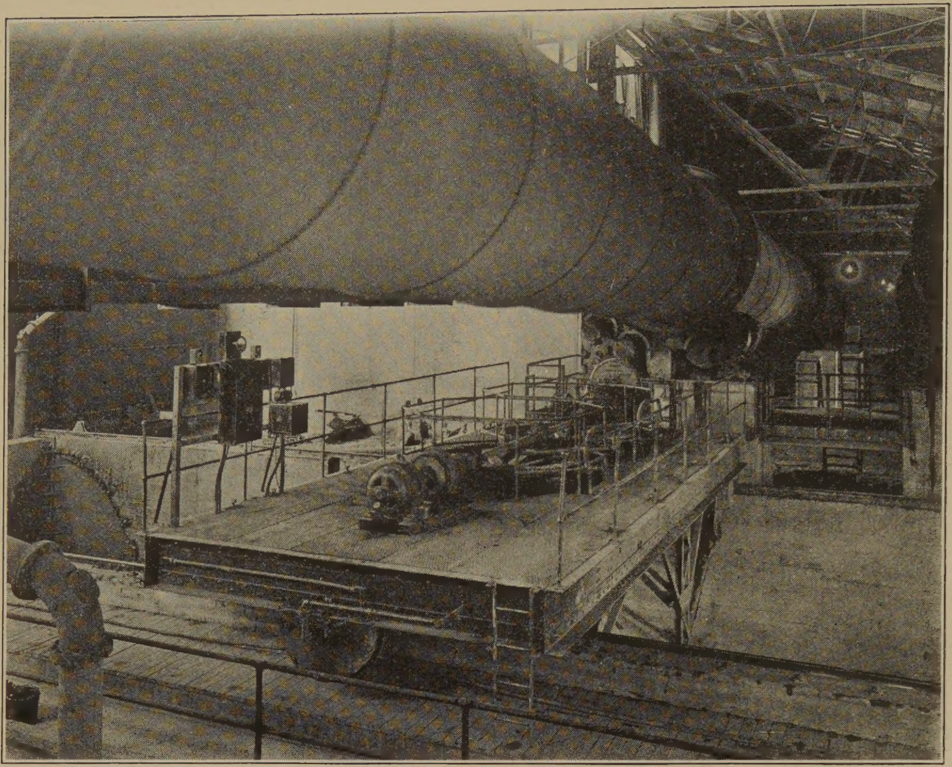


The old Schoffer kilns at the plant of the Glens Falls Portland Cement Co., about 1900. They illustrate one of the early steps taken to keep abreast of progress in cement manufacture. This is an unusually fine picture of that type of kiln, showing as it does the three levels from which the kilns were operated. The three-story buildings surrounding the kilns have been razed

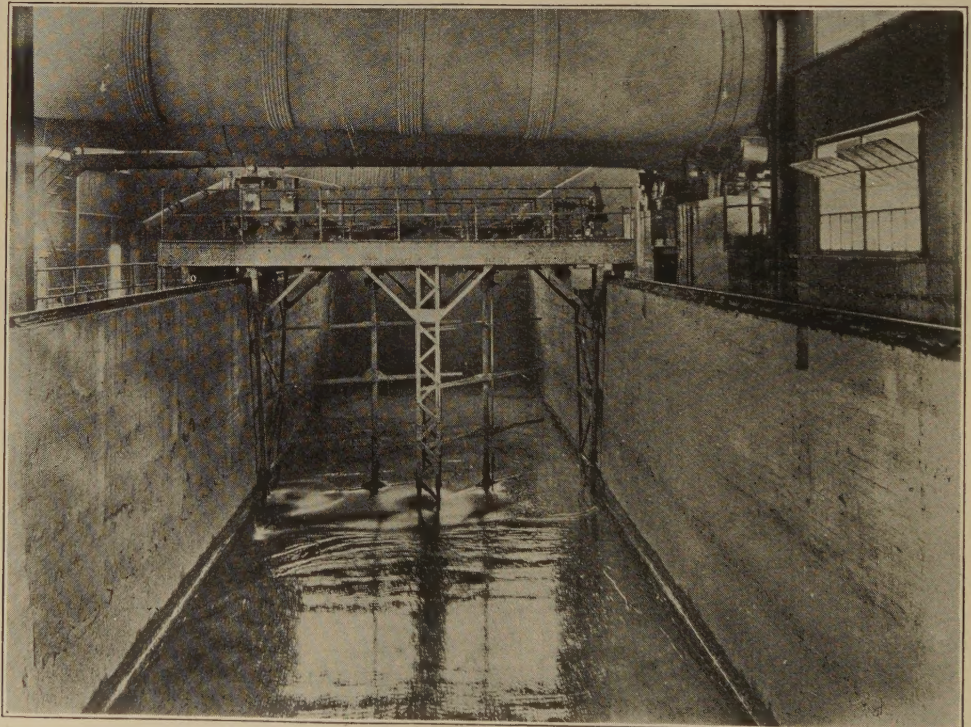
A mill for the preparation of pulverized coal used in burning clinker in the rotary kilns was also designed and constructed by this firm of engineers. This was in 1905 and in 1906 two more kilns were installed—measuring



This is the stone and clinker storage building, equipped with a Cleveland overhead electric crane



A view of the concrete slurry correcting basin, equipped with mechanical agitators, from which slurry flows by gravity into the mixing basin

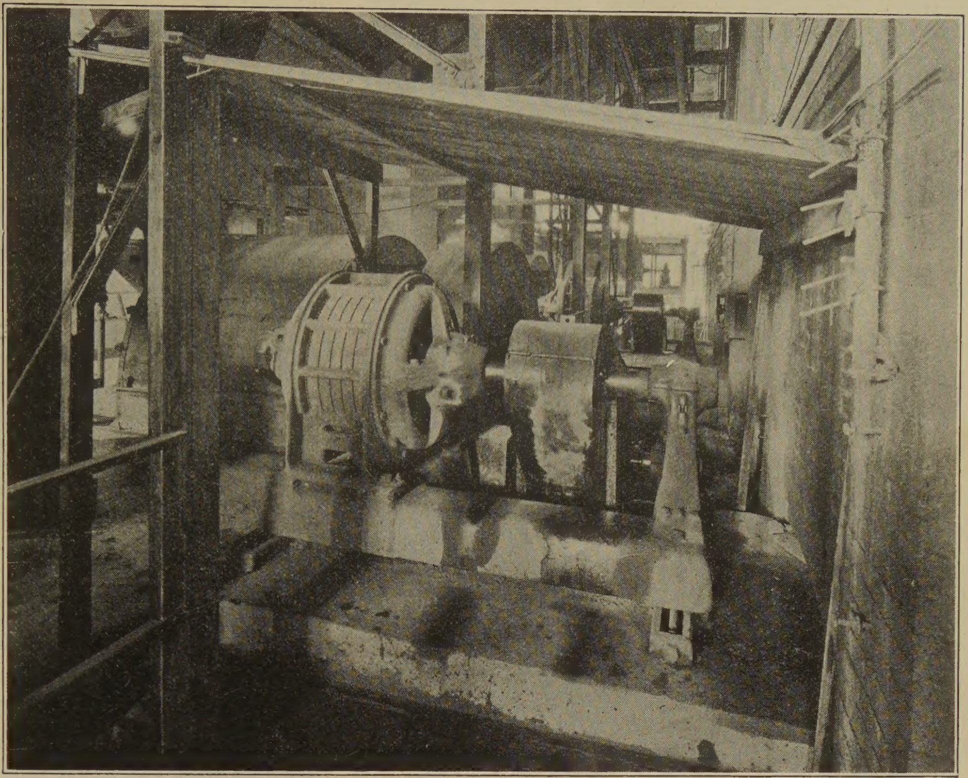


Another view of the traveling agitators for the slurry correcting basin

7 by 7 ft. 6 in. by 120 ft., with additional kominuters and tube mills in the raw and clinker grinding departments. The plant continued to operate the dry process and to make an excellent cement with this equipment.

In 1922 a new stone and clinker storage building was built with an overhead electric crane handling rock and clinker in and out of storage. This building has an approximate capacity of 15,000 tons of rock and 60,000 barrels of clinker.

The desire to not only meet the increasing requirements of A. S. T. M. standards, but to make a product which would be uniform from day to day and exceed those requirements, prompted many manufacturers to turn to the wet process. During the period from 1919 to 1925, thirty-two new portland cement plants were constructed in the United States and Canada; of this number thirty were wet process plants. It was only natural that an old established company seeking to further improve the quality of its product, as well as plant operating conditions, should change its process from dry to wet.



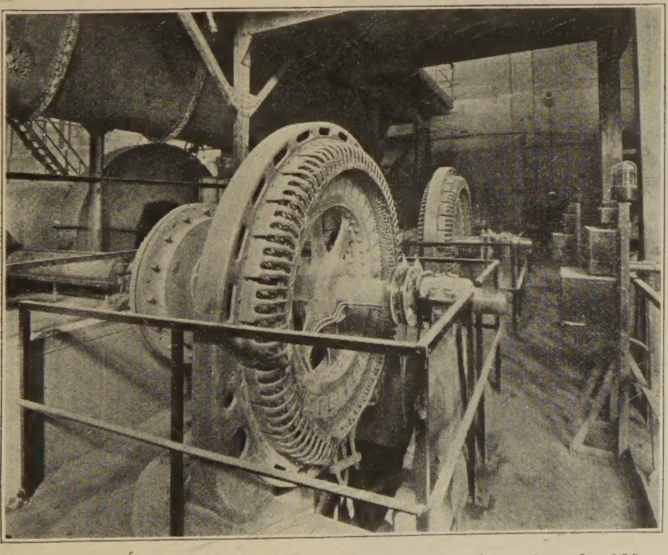
Battery of No. 85 Kominuters for wet granulating of raw materials with 125 h.p. motors and silent chain drives

In 1924, the Glens Falls Portland Cement Co. again employed F. L. Smidth & Co. to design and equip a 4000-barrel capacity wet process plant. It was necessary to utilize the buildings then in use and some of the old machinery and to erect the new without interfering with production in the existing dry plant. In fact, the entire plant was rebuilt without the loss of a single barrel in output, and illustrates what can be accomplished when engineers and constructors co-operate with the local plant organization in a reconstruction program.

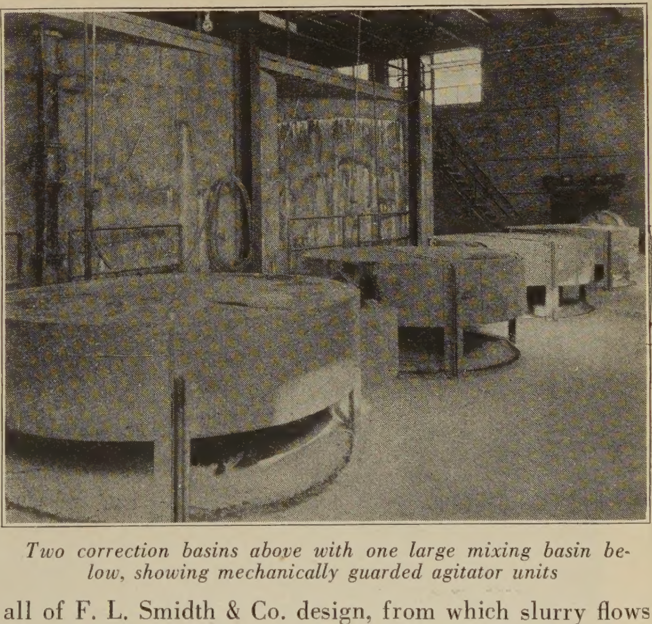
The principal features and equipment installed in 1924 were as follows:

Raw Department

Approximately 34 per cent water is added to the raw mix as fed to four No. 85 kominuters operating in closed circuit with four No. 10 Trix separators. 125 h. p. motors are used on the kominuters; 10 h. p. motors on the separators. The three No. 18 Smidth tube mills are driven by 3 300 h. p. General Electric super synchronous motors. The three-unit concrete slurry correcting basin—1440 barrels capacity—is equipped with mechanical agitators, all of F. L. Smidth & Co. design, from which slurry flows by gravity into the concrete mixing basin. The latter has a 1665-barrel capacity. Slurry is then pumped by an F. L. Smidth air lift system to a large open concrete storage basin 25 by 125 by 21 ft. equipped with a traveling agitator (rotating paddles and compressed air) holding the equivalent of 7200 barrels clinker, sufficient to supply kilns 1¾ days.



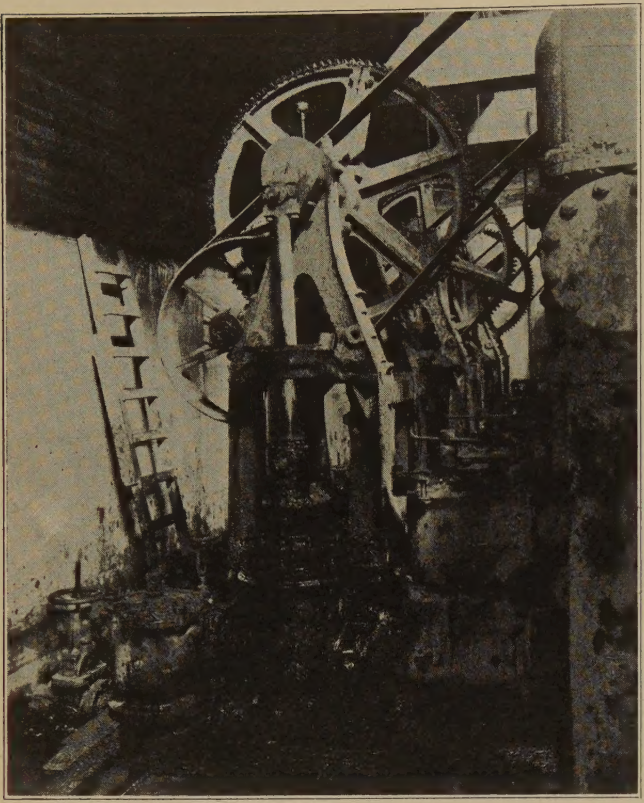
One of the tube mills in the raw department, featuring the 300 h.p. synchronous motors installed to drive these mills



Two correction basins above with one large mixing basin below, showing mechanically guarded agitator units

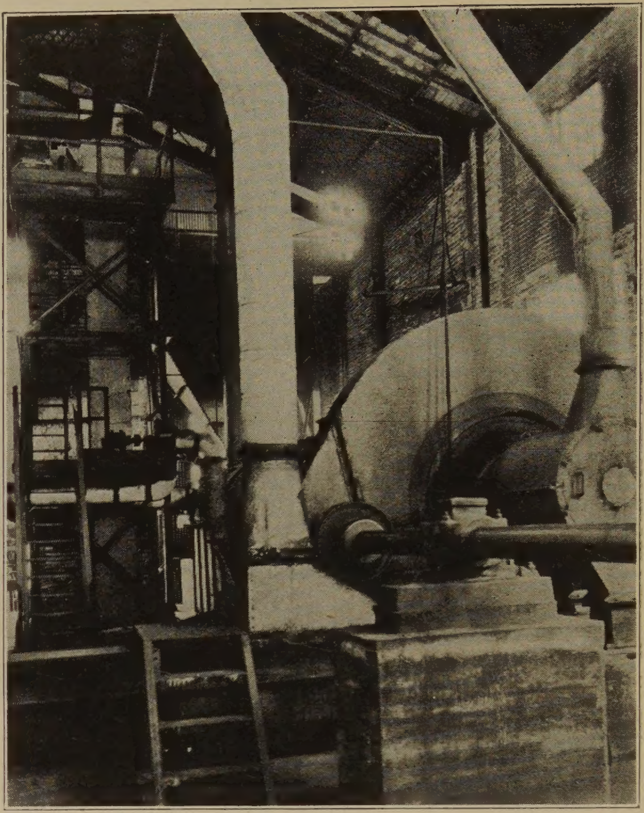
Kiln Department

The kiln department is equipped with two new kilns, 9 by 10 by 250 ft., driven by 2 75 h. p. motors, two old



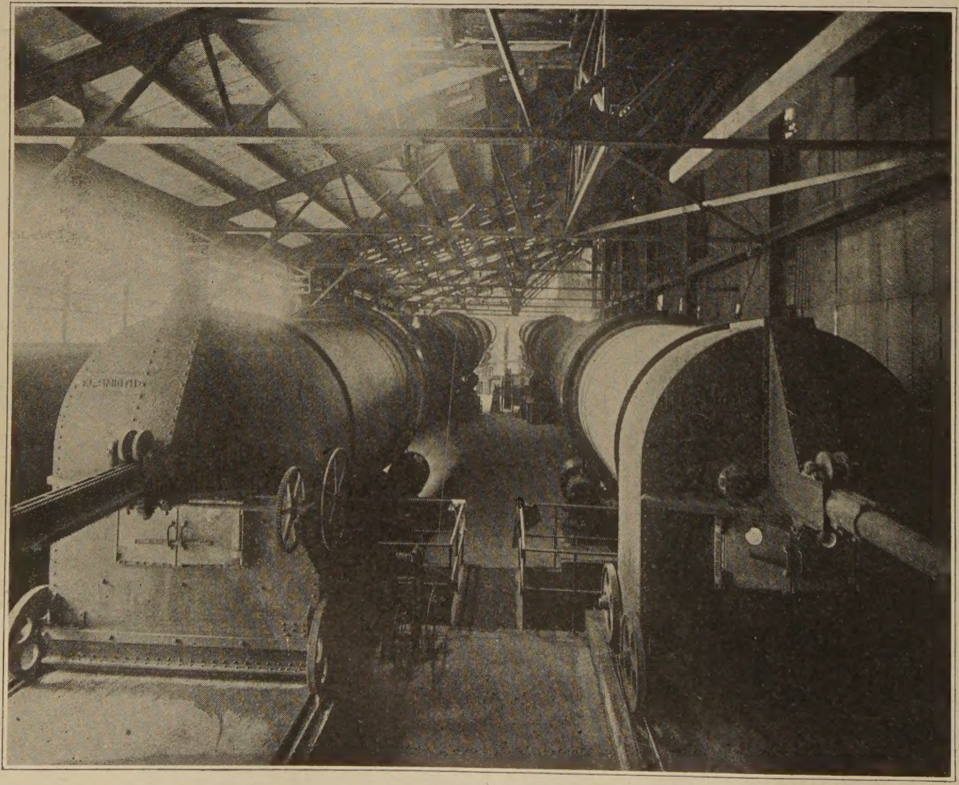
Plunger pumps for conveying slurry from supply basin to the kilns

kilns, 7 by 120 ft., driven by 2 35 h. p. motors, and two old kilns, 7 by 7 ft. 6 in. by 120 ft., driven by 2 35 h. p. motors. The new kilns are outstanding in two respects: First, the lower or discharge sections serve as coolers and supply preheated air for combustion of the coal; second, the upper end of the kiln is equipped with the F. L. Smidth & Co.'s patented chain system, which facilitates the dehydration of the slurry and increases the thermal efficiency of the kiln by better preparation of the dried material for the burning and clinkering zones.



Two pyrators dry and grind the coal in one operation

These features have resulted in a fuel consumption in the new long kilns, burning slurry with 34 per cent water, which approximates the average number pounds of coal



A view of the rotary kilns in the Glens Falls Portland Cement Company plant at Glens Falls, New York. Here the lower or discharge sections serve as coolers and supply preheated air for combustion of the coal used in the shorter 120-ft. kilns, when those kilns were operating dry with the same raw materials.

F. L. Smidth & Co. plunger pumps furnish slurry from the large supply basin to kilns, equipped with 10 h. p. motors. A McCaslin conveyor transports clinker from all kilns to two 7 by 60 ft. rotary coolers. Two concrete chimneys 8 by 248 ft. are connected with the two new kilns.

Coal Mill

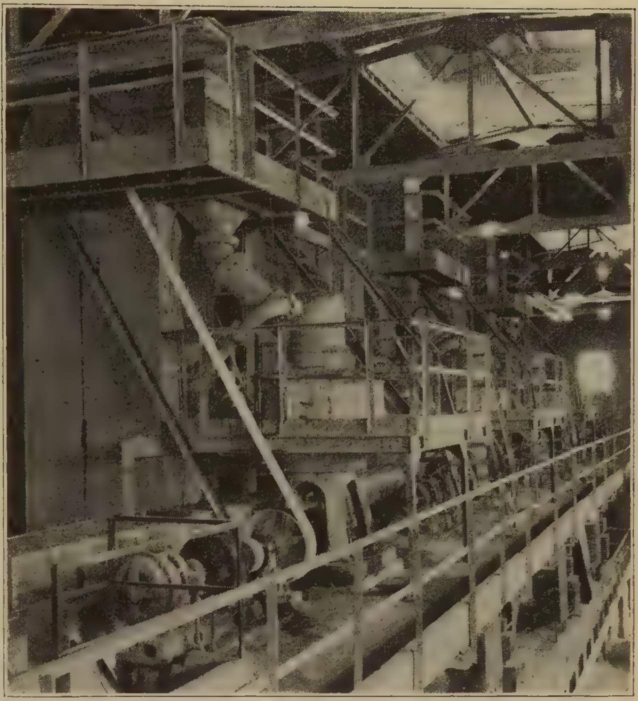
The equipment in the coal department is unique in that coal is dried and ground in one operation. This is accomplished in two F. L. Smidth & Co. pyrators; the first compartment of these machines is supplied with a circulating load of separately heated steel balls, which dry the coal and prepare it for the final grinding compartment of the pyrators. The Fuller-Kinyon pump is employed to convey ground coal to the kiln supply bins.

Clinker grinding equipment includes six No. 66 kominuters driven by 6 75 h. p. motors and five No. 18 Smidth tube mills driven by 5 300 h. p. motors. Two dust arresters keep this department remarkably clean. The spraying system is employed to reduce the internal temperature of the clinker tube mills.

The water spray system, designed and patented by F. L. Smidth & Co., for the Glens Falls tube mills, is thermostatically controlled. Temperature of cement discharged from each mill is shown on a recording thermometer, enabling the operator to maintain a nearly constant temperature by merely regulating the water sprayed on the mill.

Ironclad Velo Cement

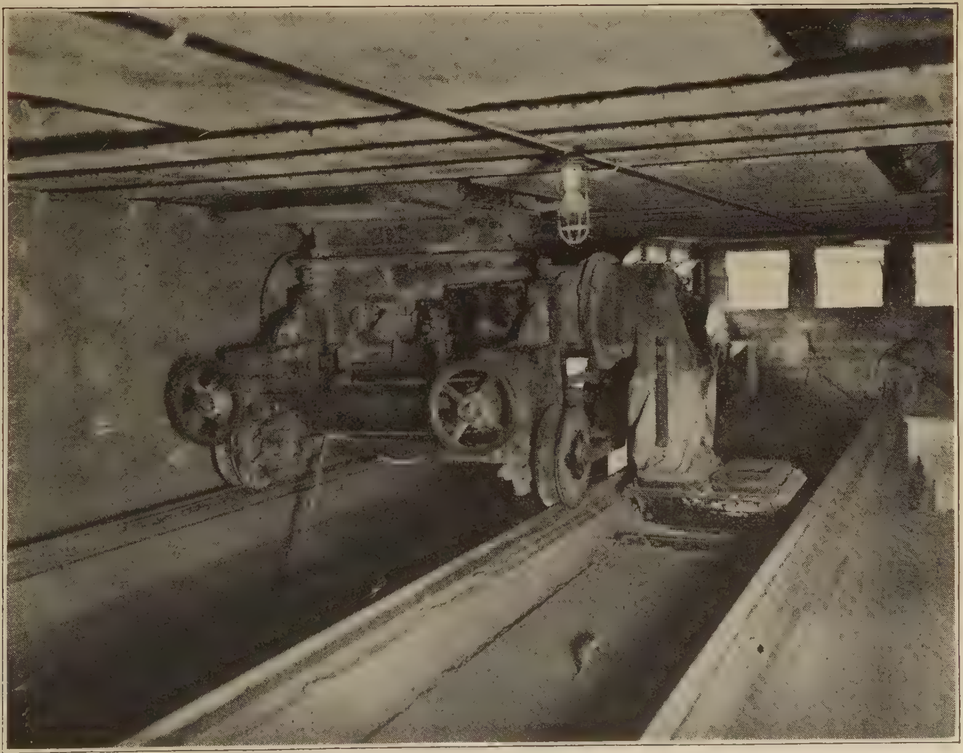
The changes and improvements already described produced standard portland cement which greatly exceeded A. S. T. M. specifications. This cement also developed high early strength tendencies, which prompted the company to investigate the properties of Velo, a portland cement developed and patented by F. L. Smidth and Company to meet the demand for quick strength. Velo cement has already been used for several years in Europe, where the demand for a quick strength cement came sooner than in the United States.



Here three of the four Trix separators installed are seen
The separators are equipped with 10 h.p. motors

This investigation showed that Velo produces a hardened concrete in 24 hours, that the one-day mortar and concrete strength exceeded the 28-day requirements of standard portland cement and culminated in the decision to make Ironclad Velo in the Glens Falls plant.

The company first made this new patented cement in November, 1927, with the same plant equipment as above described. On account of the great fineness to which raw



Exbiners are included in the Glens Falls plant equipment mix and clinker must be ground (98 per cent through No. 200 sieve) and various other reasons which may be ascribed to chemical composition, considerably less than the full productive capacity of the plant was realized when making Velo. The success and increasing demand for Velo led to the installation of additional equipment in order that approximately 4,000 barrels of standard portland or Velo might be manufactured. With additional grinding units in both raw and clinker departments, the company now has a grinding capacity of 6,000 barrels standard portland or 4,000 barrels of Velo.

The coal mill building. A Fuller-Kinyon pump conveys ground coal to the kiln supply bins

Plant Is Interchangeable

The entire plant is interchangeable and is operated at full capacity of one or the other. All storage bins and equipment are cleaned out when making the change from one cement to the other.

With the construction of a modern concrete silo stockhouse, the company now has a combined cement storage of 425,000 barrels. This also is interchangeable and can be used for either product.

Additional equipment installed to balance plant for production of Velo is as follows:

Siliceous raw material when required to maintain silica ratio is first reduced in two No. 6 gyratory crushers, and then elevated to a No. 53½ kominuter. It then passes through a No. 16 Smidth tube wet mill and the slurry is discharged into a one-unit storage basin equipped with mechanical agitators.

Velo Equipment

To further prepare the slurry when making Velo, the following were added: 2 No. 20 Smidth tube mills, driven by 2 500 h. p. motors; 3 correcting basins, making six in all, with a combined capacity of nearly 3,000 barrels and providing ample opportunity for analysis and correction of the composition.

In the clinker grinding department, the increased fineness requirements were met by the installation of one 7 by 39 ft. Smidth Unidan compartment mill, equipped with 550 h. p. synchronous motor, driven through a Smidth Symetro trunnion drive.

Velo Found Satisfactory

Very gratifying results have followed the introduction of Ironclad Velo cement. Its high early strength and rapid hardening have met the demands of engineers and contractors in work where those properties in a cement are essential. This is especially true in paving work at street intersections supporting heavy traffic; concrete made from Velo is frequently opened to traffic in 24 hours.

This quick hardening cement has helped solve many difficult construction problems where time is the important element. It is also valuable for emergency repairs to roads, bridges and buildings.

Test Results

Tests by state and municipal laboratories on Velo from warehouses and construction work show the following results:

	1 day	2 day	4 day	28 day
Tensile strength lbs. per sq. in. 1:3 standard mortar	365	391	493	520
Compression strength lbs. per sq. in. sand and gravel concrete 5 3/10 gal. water per sack 2900 lb. portland cement design	2510	3410	4450	5730
Modulus of rupture lbs. per sq. in. 1:2:3 concrete, 2-in. slump	505	795	900	970

Velo cement has been made and successfully used in Europe for a number of years. It has been shown to have the same characteristics and permanency as other portland cements, with the added property of making concrete ready for use in 24 hours. In view of its fine record abroad and the splendid start here, its increasing use on important work in this country seems assured.

Cement in Russia

Production Almost Equal to Capacity—Four Trusts Control 85 Per Cent of Russian Production—Chemical and Physical Qualities of Product

By CARL HEINRICH PETERS

FOLLOWING the complete standstill of all construction during the World War and the ravaging destruction of the civil war, the last few years have seen a gradual picking-up of construction activities in Russia. This was made possible by a corresponding development in the manufacture of structural materials.

The following table gives a review of the development of the entire Russian structural materials industry in the course of the last four years:

		1926			1927			1928			1929	
	Demand	Mfg. Program	Actual Output	Demand	Mfg. Program	Actual Output	Demand	Mfg. Program	Actual Output	Demand	Mfg. Program	Actual Output
Cement in 1,000 bbls.	9,400	9,135	8,129.9	12,760	12,760	10,030	12,565	12,565	12,611	15,000	14,515	13,460
Brick—million units	1,200	1,100	1,075	1,670	1,450	1,500	1,818	1,818	1,760	2,677	2,620	2,445
Refractories—1,000 t.	580	580	559	686	611	630	743	664	645	758	745	683
Lime—1,000 t.	262	152	128	327	168		data incomplete			734	750	700
Alabaster—1,000 t.	125	136	104	164	167		"	"		335	325	281
Chalk—1,000 t.	121	88	73	196	94		"	"		250	265	252

The manufacture of cement and refractories during the span from 1917 to 1927 has risen above pre-war figures; the other products approach their pre-war standards.

The rehabilitation of the cement industry began by putting in operation the plants of greatest capacity and those which had suffered least destruction. This explains the relatively small rise in the cost of cement compared to other structural materials (Index 1.44). The gradual progress of the cement industry caused the reconstruction of some less completely conserved plants, whose overhauling demanded considerable funds.

The following table affords a review of cement production from 1922 to 1928:

	Production 1,000 bbl.	Per cent of Preceding Year
1923	1,390	— —
1924	2,250	161.8
1925	4,454	197.9
1926	8,143	182.5
1927	10,000	124.1
1928	12,611	124.7
1913	10,008	

The rapid development of construction activities preceding the war had called forth the building of many cement plants poorly planned and operating inefficiently, which had to be given up. At present there are 30 plants in operation, whose yearly capacity amounts to 12,675,000 bbl., so that the manufacturing schedule for 1928 and the actual output (12,611,000 bbl.) are close to the limit of production. A further increase in production necessary to meet the growing demand requires an extension and re-equipment of existing plants or the construction of new plants.

Because of rebuilding of the existing plants, the production is to be raised within the next four years, i. e., up to 1933, by 6,930,000 bbl. Beyond this figure the demand must be met by providing new plants. These may be divided in two groups: plants which are to be set in operation before 1932, and plants whose construction will be begun before that year, but which will not be set in operation until later. Altogether 13 new cement plants are to be under construction during the period from 1927 to 1932, of which 7, with a total capacity of 4,200,000 bbl., will take care of the increasing demand until 1933.

First two plants are to be built during 1930: one in Georgia (Transcaucasia) and the other in Kirghisia. Five other plants are to follow in 1931: one in Armenia (300,000 bbl.), one in the Voronezh district (600,000 bbl.), two in the Ukraine (1,600,000 bbl.) and one in the Cherepovetz district, east of Leningrad (500,000 bbl.).

The plants of the second group, whose operation is to be begun after 1933 are: two plants in the Ivanovo-Voznessensk district (1,200,000 bbl.); one in the Ural (750,000 bbl.) and one in the Ukraine (900,000 bbl.); the rest with a total capacity of 4,350,000 bbl. a year. The total increase in production through the construction of all these plants will raise the annual Russian cement output by 10,280,000 bbl., which is ample to take care of the growing demand.

Trusts Control Production

Nearly 85 per cent of the present cement production is in the hands of four state cement trusts, while the executive power rests with the Soviet of National Economy in Moscow. The Soviet has recently advocated various measures for lowering the price of structural materials including cement, such as a gradual change to paper bags, a centralization and reduction of costs of cooperage, reduction of fuel costs by determining the best grade of coal for calcination of clinker and the rationalization of all manufacturing and other involved processes.

Before the war, Russian cement was exported mainly to the countries around the Black Sea and to Persia. In 1913 the total export amounted to 6920 tons. Following the war, the export to Turkey and Persia was soon resumed and the year 1923 saw considerable quantities exported to Turkey.

The exports have grown from year to year and in 1925 reached the figure of 30,078 tons, i. e., about 5 times the

---

Translated from *Zement*.

pre-war value. During the next three years Russian cement exports were as follows:

	1926		1927		1928	
	Tons	1000 rubl.	Tons	1000 rubl.	Tons	1000 rubl.
	35,908	766	44,792	680	50,052	742
Equiv. in marks	—	1,655,000	—	1,469,000	—	1,603,000
Equiv. in dollars	—	397,200	—	352,560	—	224,420

The equivalent in German marks is computed assuming 100 rubles equal 216 marks. A mark is assumed to be worth 24 cents.

The export figures were:

	1926 tons	1927 tons	1928 tons
Italy	—	0.3	4,802
Latvia	—	658	4,950
U. S. A.	3,698	0.5	—
Turkey	26,611	34,792	15,069
Finland	—	33	16
Sweden	—	0.2	—
Estonia	—	—	4,125

According to official Turkish statistics, of the total Turkish imports 16,913 tons in 1925, 7,361 tons were imported from Russia, i. e., 43.5 per cent of the total import.

Most Important Point of Exportation

The most important exporting center of the Russian cement industry is near Novorossiisk on the Black Sea. The plant is located near the harbor, so that direct shipping of cement by boat is possible. Around Novorossiisk are located extensive deposits of marl (Mergel), in which the marl has the exact composition of standard portland cement. It is, therefore, possible to proceed without preliminary treatment and mixing of materials, manufacturing a natural cement of very high quality. The elimination of preliminary handling naturally results in greatly reduced manufacturing costs, so that cement manufactured in Novorossiisk can withstand competition not along the entire coast of the Black Sea, but along the eastern shores of the Mediterranean as well. The raw material is present in Novorossiisk in sufficiently large quantities. As fuel can also be had easily and in sufficient quantities in that locality, a further increase in cement manufacture would result in increased exports.

Expect to Enter South American Market

The demand for Novorossiiski cement is, therefore, rising in Turkey and in Egypt, and it is to be expected that in the future a number of distant countries, such as a good many of the South American countries, which import cement from Europe in large quantities, will begin to import it from Novorossiisk.

The chemical composition of Novorossiiski cement is as follows:

	Per Cent
SiO_2	25.41
Al_2O_3	3.84
Fe_2O_3	2.10
CaO	64.60
MgO	0.62
SO_3	0.93
Alkalis	0.94
Loss on ign.	1.54

The specific gravity of the cement upon ignition is 3.170.

Hardening of the cement begins after 3 to 4½ hr. The set is from 8½ to 10 hr. The residue of the 900-mesh sieve is 2.5 per cent. The amount of the 4900-mesh sieve is 8.2 per cent. The tensile strength in kg. per sq. cm. is:

	at 7 days	at 28 days
Neat cement	41.50	48.15
1:3 standard sand mortar	19.16	24.00

A 1:3 standard sand mortar with 8.75 per cent mixing water yields a tensile strength of 29.2 kg. per sq. cm., a compressive strength of 289 kg. per sq. cm. and a ratio of tension to compression of 1 to 9.9.

Further cement centers are around Volsk on the Volga, in the Donetz Basin, south of Moscow and near Leningrad. In 1910 33 portland cement plants produced 1½ million tons cement. The number of plants was doubled by 1915 and their production had risen to 4½ million tons. Post-war conditions brought about a drastic drop in cement production, which has been gradually picking up in the last few years. Russian barrels weigh 10 pounds = 0.164 tons.

In the not too distant future the countries around the Baltic will feel the invasion of high test alumina cement, produced southeast of Leningrad from local materials.

Deposits of lime and bauxite are available in Tihvin in the Cherepovetz district, east of Leningrad. Shipping conditions between that location and the Baltic are not unfavorable, as most of it can go by water. Suitable fuel is also available in the vicinity of the bauxite deposits, so that all required conditions are satisfied for the production of a high test alumina cement at low cost.

The preliminary work for this branch of production has been begun. Its progress should be of interest to all German countries near the coast of the Baltic, as these countries have no such favorable access to any other European bauxite deposits, as to the Tihvin deposits (200 km. east of Leningrad, 12,000 inhabitants), which furnish in large quantities the essential material for the manufacture of alumina cement, which is lacking in Germany.

Ideal Declares Three Dividends in December

The Ideal Cement Company of Denver, Colorado, recently declared three dividends on its common stock. The regular dividend of 75 cents, payable January 2nd, an extra dividend of 50 cents, and a special dividend of 50 cents, payable December 21st to stockholders of record of December 15th.

Ideal will have paid out in dividends during 1929 the sum of $1,757,271 on the 458,271 shares outstanding.

Pennsylvania and Michigan Have Highest Number of Cement Plants

Pennsylvania and Michigan rank first and second, respectively, in number of cement plants. Pennsylvania, California and Michigan are the largest cement producers, followed by New York, Alabama and Illinois, recent statistics disclose.

California is said to use more cement per capita than any other state, with Michigan second, though California is fourth in the list of total amount used and Michigan fifth.

Giant Dividend

The Giant Portand Cement Company, Philadelphia, Pa., declared a regular semi-annual dividend of $1.75 on preferred stock, payable December 16th to stock of record December 2nd.

Canadian Dividend

The Canada Cement Co. declared a regular quarterly dividend of $1.62½ on preferred stock, payable December 31st to stock of record November 30th.

EDITORIAL

Aftermath

THE results of price-cutting within an industry are usually measured in terms of financial loss, demoralization, and an increased sense of distrust, instead of continued co-operation, among the members of the industry involved. The recent cutting of prices of cement seems to have had still further evil results, because of its coincidence with certain other movements of interest to the portland cement industry.

It seems that during this period of reduced prices, the state highway commission of Indiana let its contract for cement for 1930 at a saving of about $500,000 compared to the 1929 prices. The Star of Indianapolis took occasion to explain that the reduction of about twenty-five cents a barrel was due to the influx of Belgian cement, and that this explanation was interesting in view of the claims that a tariff on cement would not advance the cost of cement to the consumer. This newspaper concludes: "While the 10-cent tariff might not have increased prices here, if failure to get it means a 25-cent saving on a barrel, Hoosiers cannot be said to have no interest in the tariff proposal."

Just about the time of the Hoover Industrial Conferences came the restoration in the price of cement, which brings an editorial from Elmira, New York, headed "Grab Into Hoover's Plan." This newspaper cites President Hoover's call for a conference of business leaders to maintain full employment and develop buying power, the announcement of these leaders to co-operate with hundreds of millions of dollars worth of construction, the promise by employers not to cut wages, and by labor leaders not to ask for increased wages; and then notes that "Here come several cement companies operating in New York, New England and other sections of the East to declare an advance of 30 cents a barrel on portland cement," with a "desire to cash in on the lofty purposes of those who are seeking to smooth out a threatened cycle of depression."

Public opinion is still something to be courted by the cement industry as much as by other industries, and, while unprejudiced views cannot yet be expected from all newspapers, the recent price-cutting has in this case given at least two editors, each with his own following, the chance to take a rather hard slap at the proposed duties on cement, and at the business patriotism of the cement industry.

Changed Conditions

WHILE 1930 should not be viewed through rose-colored glasses by any industry, it begins to look as though portland cement manufacturers need not use the real dark-hued ones.

At the time of the annual P. C. A. meeting in Chicago the middle of November, price-cutting had brought the price of cement down ten, and twenty, and thirty cents a barrel. Concrete construction, with other building, had begun to slump.

At the Hoover Industrial Conference early in December, Frank H. Smith, reporting as the president of the Portland Cement Association, very properly drew attention to greater capacity, lower production, smaller shipments, and larger stocks, and predicted a decrease of from five to ten per cent in the use of portland cement for 1930.

But since that time—

Brokers' loans have been decreasing. Building and loan association money has been coming back home from Wall Street. Favorable attention of investors has been drawn toward real investment, rather than speculative. Cement prices are up again. The pledges of the various industries at the Hoover conferences to push construction activities have been rounding into form. Christmas business has been excellent in most localities, and surpassed previous years in many.

With all these favorable developments, it would seem that there is a distinct promise of considerable activity in all projects in which portland cement enters as a construction material.

This thought is accented by leaders in all lines, who, after making predictions in their own industries, add that they expect the building industry to develop more favorably than theirs. It is also borne out by banking predictions that 1930 will be a little quieter year than 1929, except in the building industry.

With 1930 construction promising to be as good as, if not better than, in 1929, there is a better than even chance to bring cement shipments up over the 1929 figures, if the industry and every manufacturer in it will speedily put into force the rather old slogan, "If you want anything, ask for it; if you've got to have it, go after it." Now is the time to start co-operative plans to make 1930 a better year than 1929, and ***it can be done.***

U. S. Steel May Purchase Atlas Portland

Atlas Portland Cement Company stockholders have been informed of an offer by the United States Steel Corporation to take over the assets of the former in exchange for 180,000 shares of steel stock valued at $31,320,000. A special meeting of stockholders was to be called for December 28 to ratify the agreement.

In exchange for the stock, the steel corporation would acquire the 899,211 shares of common stock of the Atlas company, together with its entire assets and good will. The preferred stock of the company was retired recently and there is no bonded indebtedness.

If the proposed consummation takes place, the United States Steel corporation may become the largest production interest in the portland cement industry in the United States. The purchase of the Atlas company would give the steel corporation an aggregate capacity of 56,500,000 barrels annually.

Operations of the Atlas company will be merged into the Universal Portland Cement Company. By combining these two organizations, the steel corporation will become the most powerful factor in the cement industry, as it now is in the steel industry.

Indiana Awards Contracts for Highway Cement

Two million barrels of cement were contracted for with Indiana, Illinois, Ohio and Kentucky companies by the state of Indiana on December 4th.

With only four exceptions, the commission responded to the pleas of the Indiana coal bureau and a group of cities and towns in the Indiana coal belt for the commission to give its business to companies using domestic fuel.

The Marquette Cement Manufacturing Company, with a plant at LaSalle, Ill., received the contract for supplying 500,000 barrels of cement for the use of the commission. When bids were received some time ago, the Marquette Company was the low bidder on the 500,000 barrels it proposed to supply the commission. Subsequently, other bidding companies lowered their bids in accordance with the bid of the Marquette Company on permission of the commission.

Following opening of the bids, a delegation of representatives from nearly twenty towns and cities in the Indiana coal belt, at the instance of the Indiana coal bureau, visited the commission and insisted on having preference extended to cement companies consuming domestic coal.

Other companies receiving contracts, the location of their respective plants and the amount each will supply follow:

Universal Portland Cement Company, Buffington, Indiana, 475,000 barrels; Lone Star Portland Cement Company, Limedale, Ind., 475,000 barrels; Lehigh Portland Cement Company, Mitchell, Ind., 225,000 barrels; Louisville Cement Company, Speed, Ind., 200,000 barrels; Wabash Portland Cement Company, Stroh, Ind., 50,000 barrels; Pittsburgh Plate Glass Company, Zanesville, O., 25,000 barrels; Kosmos Portland Cement Company, Kosmosdale, Ky., 25,000 barrels, and the Medusa Portland Cement Company, Sandusky, O., 25,000 barrels.

Peerless Egyptian Company Changes Name

On December 1st the former Peerless Egyptian Cement Company became the Peerless Cement Corporation. The change in name and another in capital structure were authorized at a directors' meeting in the Detroit, Michigan, offices of the firm on November 15th.

The change in capital structure will be effected by the issuance of new stock, one share of which will be exchanged for five shares of the existing stock. The directors voted a dividend of $1 a share on the new stock, payable December 20th to stockholders of record December 5th.

Middle West Freight Rates Found Unequal

Important recommendations on portland cement rates in Iowa, Nebraska and Illinois are contained in a proposed report of Examiner J. P. McGrath to the Interstate Commerce Commission at Washington, D. C.

The Dewey Portland Cement Company, of Linwood, Ia., was the chief complaintant against existing rates.

"Rates on portland cement, in carloads," said Mr. McGrath, "from Linwood, Ia., to destinations in Illinois, Wisconsin, Iowa, Missouri, Nebraska and Minnesota found not unreasonable or unduly prejudicial, with certain exceptions.

"Intrastate rates on portland cement, in carloads, from LaSalle, Oglesby and Dixon, Ill., to Chicago, Ill., found unduly preferential of cement manufacturers at the origin points named and of intrastate traffic from those points and unduly prejudicial to complaintant and interstate traffic from Linwood. Defendants given opportunity to remove undue preference and prejudice.

"Interstate rates on portland cement, in carloads, from LaSalle and Oglesby, Ill., Ilasco, Mo., and Mason City, Ia., to Wausau, Wis., found preferential of cement manufacturers at the points of origin named and unduly prejudicial to complaintant. Undue preference and prejudice ordered removed."

MacDonald Engineering to Start Work on Soviet Contracts in Spring

Robert P. Durham, president of the MacDonald Engineering Company, Chicago, has announced that construction work on the concern's $110,000,000 contract with the Soviet government would be started early next spring.

He said also that company engineers would leave next month for Russia and that the construction superintendents would make the trip to Russia in the spring.

Riverside Portland Cement Company to Dissolve

Petition for the dissolution of the Riverside Portland Cement Company, a $6,500,000 corporation, was filed November 16th.

The officers in asking permission to dissolve stated that on October 21st two-thirds of the stockholders voted for this action and that there were no outstanding obligations.

Pacific Dividend

Directors of the Pacific Portland Cement Company have declared a special dividend of $2 on the common stock, payable December 18 to stock of record December 14. This is the first dividend declared since the merger with the Mission Cement Company.

Wolverine Quarterly

The Wolverine Portland Cement Co. declared a regular quarterly dividend of 15 cents, payable November 15th to stock of record November 5th.

Impurities Cause Slow Hardening in Concrete

An Investigation of the Cause of Slow Hardening of Concrete Using Mine Chippings as Aggregate

By J. E. WORSDALE
Chemical Engineer, The Pretoria Portland Cement Co., Ltd., Pretoria, South Africa

THE writer is a keen student of American technical literature regarding cement, aggregates and concrete, and has derived great benefit therefrom, but has been greatly struck by the comparative absence of chemical considerations applied to the study of aggregates. The physical condition, geological origin, mineralogical composition, grading and absorpton are frequently considered in great detail, but the chemical composition and possibility of the presence of chemical impurities appear to have been given but scant attention. Personal experience with just one type of chemical impurity will perhaps indicate the value of this field of testing.

The failure of a floor in hardening first drew the writer's attention to the importance of the chemical examination of aggregates. In this particular instance, the concrete was made from 4 parts mine chippings and 1 of cement, and examination in the laboratory definitely indicated that some peculiarity of the former was responsible for the trouble. Analysis showed the chippings to consist of about 75 per cent silica, together with compounds of lead, calcium, zinc and magnesium and sulphides and carbonates. The lead would almost certainly be present as sulphide, but the zinc might be present as sulphide, oxide or carbonate. The trouble obviously lay in the presence of one of these unusual substances, so in order to determine which, the problem was approached by making concrete and adding definite quantities of lead sulphide, zinc sulphide, zinc oxide and zinc carbonate to the mix. The table below gives a summary of the results of the experiments and shows that zinc in the form of oxide or carbonate is responsible for slow setting.

EFFECT OF ADULTERANTS ON STRENGTH OF CONCRETE

Materials Added to the Extent of 3 Per Cent Weight of Cement	Strength of Concrete Expressed as Per Cent of Strength of Similar Concrete Containing no Adulterants				
	7 Days	28 Days	3 Mths.	6 Mths.	12 Mths.
Lead Sulphide	87	111	96	99	111
Zinc Sulphide	103	102	97	95	106
Zinc Oxide	14	69	75	68	66
Zinc Carbonate	Not done	12	42	76	64

Trent gravel, sand and cement were used in the proportions of 4:2:1.

Two further samples of the mine chippings were then tested in comparison with similarly graded granite chips, with the following results:

TESTS OF MINE CHIPPINGS

Sample	Per Cent Zinc Carbonate	Strength of Concrete Expressed as Per Cent of Strength When Using Similarly Graded Granite Chips			
		7 Days	28 Days	3 Mths.	6 Mths.
No. 1	3.8	0	2	56	85
No. 2	0.08	5	90	105	107

These tests were made using the chippings as received and cement in the proportions of 4:1, stored in water.

When it is stated that the original sample of chippings contained zinc as carbonate to the extent of over 6 per cent, the unsatisfactory behavior should not cause great surprise. Further tests on small pats showed that apart from the slowing of the set, the real danger lay in allowing the mixing water to evaporate before the set could commence, since when that happened the concrete was permanently ruined.

Since that time, many opportunities have occurred of examining aggregates containing zinc compounds, sent for examination because of similar complaints and in most cases the concrete has been saved when it has been kept thoroughly wet.

There are undoubtedly large quantities of excellent chippings and spar put in the market, but on account of the possible contamination, these should be tested before use. The harmful materials in all these zinc-bearing aggregates are concentrated in the fine dust, and removal of this, by washing, usually produces a first-class material.

American Tests

Chert and calc-spar are the two chief offenders in this country and it would be of interest to learn if similar results are experienced in America. The writer has come across only one instance in your literature where tests of mine chippings are given in comparison with other natural rock screenings. This is in Technological Paper No. 58, of the Bureau of Standards, where tests are given of 7 samples of "Chats" together with 18 tests of other stone screenings, mainly consisting of limestone. Compression tests of 1:4 mixtures give average results of 1,195 and 1,638 lbs. per sq. in. respectively at the age of 7 days, and the difference cannot be explained in differences in grading since the samples in each group of tests varied sufficiently to cut out this factor. Again, when the 1:3 tests are shown as a ratio to the 1:4 series, we find that the "Chats" show average figures of 2, and the natural stone screenings 1.47. This is what might be expected if a chemical impurity is present which reacts with the cement, since with a greater proportion of aggregate, so would the concentration of the impurity to the cement increase, with consequent greater action. The nature of the impurity alleged to be present is suggested by the origin of the "Chats," which are described in the report as "Zinc Mine Tailings."

It is the writer's earnest suggestion that when aggregate is known to have its origin in mines, that a pat should be made up 3 parts to 1 of cement and compared in hardening with a similar test piece in which similarly graded granite, or other first class aggregate is used. This simple precaution would prevent the laying of a vast amount of indifferent concrete.

Canada Cement to Replace Raw Mill and Burning Equipment in Change to Wet Process

Following upon its decision to convert its Plant No. 1 at Montreal from the dry process to wet process, the Canada Cement Company is about to replace almost entirely the raw mill and burning equipment.

Orders have been placed with F. L. Smidth & Company, New York City, for the following: 4 Unax rotary kilns, complete, with Unax coolers, 5 new, four-compartment, Uni-Kom grinding machines, direct-connected through Symetro drives to 900 h. p. motors, agitators for a complete system of slurry agitation, correction and storage, and a Skipulter.

On the clinker side the firm will use its present kominuters and tube mills.

Medusa Files Rate Objection in Pennsylvania

The Medusa Portland Cement Co., of West York, Pa., has filed a complaint with the Interstate Commerce Commission in objection to shipments by the railroads between York and points in New York and New Jersey.

The rates are claimed to be unreasonable and excessive, and when compared with shipments made to the same destinations from competing companies' plants in Northampton and points in the Lehigh district, unduly preferential of those competitors.

The commission is urged to prescribe reasonable rates for the future to apply on all cement shipments from York to destination within the free lighterage limits of New York.

New Bohemian Mill Placed in Operation

The Czechoslovakian cement firm, Fabrique de Ciment de Kraluv Dvur, has constructed a mill at Ciskivice, Bohemia, for the manufacture of cement by the wet process. The mill, which was constructed by Siemens and Halske, is both in size and the modernity of its equipment unrivaled in Europe. It is already in operation and its product will be on the market shortly.

Famous British Cement Magnate Bankrupt

An event of far-reaching importance to the British financial world has been the recent announcement that H. S. Horne, one of the best-known figures in the European cement industry, has been compelled to apply for a receiving order in relation to his affairs. This has necessitated the vacating of all his directorships. Mr. Horne, in a letter to the British Cement Products & Finance Co., said that it was because of the very serious losses he had sustained through the exceptional depreciation which had taken place in his holdings in those companies with which he had been particularly identified that it had become necessary for him to file his petition.

Mr. Horne has been prominent in recent years chiefly by reason of his having brought about a vast amalgamation of cement companies forming what is known as the Red Triangle group. These companies comprise the Allied Cement Manufacturers, Ltd., its subsidiaries, British Cement Products & Finance Co., and Associated Anglo-Atlantic Corporation. The stocks of these undertakings have fallen very heavily in the past year. To what extent they have fallen in sympathy with the general decline in security prices, and to what extent, if any, the fall has been due to specific causes affecting these particular companies, is not known, but the board of the Allied Cement Manufacturers, Ltd., states that Mr. Horne's resignation has no effect on the company's commercial position.

Shareholders of the British Cement Products & Finance Co. held a meeting immediately after Mr. Horne's resignation to consider the heavy fall in the value of their shares. S. E. A. Eades, who presided, said it was imperative that an immediate investigation of the whole group of Horne companies should be undertaken. He recommended that a committee be formed for the purpose, and suggested an initial fighting fund should be organized to enable them to get into touch with the rest of the stockholders of the Horne group.

The Horne companies control more than $15,000,000 of capital.

Mr. Eades said that 1,000,000 4s ($1.00) shares in the Allied Cement Co. had been privately allotted to two men who were employees of the British Cement Products & Finance Co. Shareholders in other companies were not advised of this issue, which was made at par when the market value of the shares was 2s. (50 cents).

"What was the object of this action?" asked Mr. Eades, "which was taken before the report and balance sheet of British Cement Products was due? Why purchase at 4s., when they could have been had at 2s.? Have the allottees still got these shares or have they sold them?"

It is these facts that Mr. Eades' committee hopes to unearth.

A stock broker in the early days after the war, Mr. Horne became greatly interested in the cement industry and at one time had, in association with other financiers, a large interest in the Associated Portland Cement Manufacturers, Ltd., the "Blue Circle" combine. After leaving the stock exchange, he devoted his energies and enthusiasm to the organization of a group of cement companies outside the combine. He acquired control of the Ship Canal Portland Cement Co., Holborough Cement Co., Greaves, Bull & Lakin, and the Dunstable Portland Cement Co. These undertakings he eventually consolidated under the control of the Ship Canal Portland Cement Co., whose name was then changed to Allied Cement Manufacturers, Ltd.

Stocks Follow Cement Prices in Upward Trend

Prices of cement shares on the New York stock exchange and on the curb advanced vigorously shortly after announcement of a general cement price increase of ten to fifty cents was made, late in November. Prices were advanced 30 cents a barrel in New England, Hudson River and Lehigh Valley district, 20 cents in New York City, and from 10 to 50 cents in southeastern territories.

Czech-Danish Cement Plant in Egypt

Andre Klar, of Ledec, Czechoslovakia, is building a modern cement mill at Heluan, near Cairo, Egypt. Danish capital is invested in the enterprise.

Dividend Declared

The International Cement Corporation declared a regular quarterly dividend of $1 on its common stock payable December 31st to stock of record of December 26th.

German Products Dominate Nicaraguan Cement Market

United States Ranks Second in Supplying Central American Field—Steel Barrels Preferred for Packing

THE wide difference in Nicaraguan price is due largely to the difference in freight rates. Although these rates are not stated on manifests of cargo arriving at Corinto from Europe, it is known that they are exceedingly low. German and Swedish ships which have a more or less regular itinerary to Pacific Coast ports to load coffee for Europe frequently have little or no cargo on the outward bound voyage, and consequently are willing to accept shipments for Central American ports for very low rates, probably not exceeding $3.00 per ton, according to a report by the American consul at Corinto, Nicaragua.

German Credit

In addition to this advantage, German exporters offer longer credits; usual credits are 90 days, and sometimes credit up to 180 days is granted.

Aside from prices and credits, there is no preference for the German or European cements. Purchases are made subject to uniform standard specifications, and the European products are considered to be equal in quality, although not superior, to the American.

The packing preferred in this market is in steel drums of 170 kilograms; wooden barrels, however, are almost equally acceptable. Containers are not returned to exporters for credit; these have, however, a definite value locally, empty steel drums being saleable at about $0.30 each, and wooden barrels at about $0.20 each. Thus packing in steel or wood, as opposed to cloth or paper, which have occasionally been tried, has a definite value in addition to the greater safety in shipment.

Retail Price

Import duties on cement, according to item 24 of the Nicaraguan customs tariff, amounts to $0.08 per 100 kilograms, plus a surtax of 25 per cent of the gross amount of duties assessed. This, plus port charges of $1.60 per ton for wharfage, customs handling charges of $1.60 per ton, charges of customs brokers for clearance and handling, amounting to $1.60 per ton, and railway freight and other charges add about $1.25 per barrel before the cement is placed in the hands of a dealer in an interior city. The importer usually calculates a profit of about 10 per cent; and where the cement passes through the hands of another dealer, an additional profit of 10 per cent or more is added. Consequently, as compared with a c.i.f. price of $2.75, for example, the sales price of the importer to the dealer will be about $4.50, and the retail price will be between $5.00 and $5.50.

Few Native Importers

Comparatively few local firms are importers of cement for resale, as the margin of profit is small, and the business is profitable only if large quantities are handled. The largest importers at the present time, probably, are those consumers who purchase for their own use, such as the railway, the paving contractors and the government department in control of road building, and one large sugar estate.

Finally, large importations are made periodically by the paving company in charge of the paving at Managua.

No cement is manufactured in Nicaragua, all needs being supplied by imports. The following table will show the volume of importation, by countries of origin, during the past two years:

Imports of Cement Into Nicaragua

	1926		1927	
Country	Bbls.	Value	Bbls.	Value
United States	2,659	6,934	1,941	5,634
Germany	9,699	17,511	9,335	14,819
Great Britain	1,979	2,396		
Italy	2,982	4,937		
Other Europe	1,298	1,978	2,598	6,638
Panama			76	179
Total	16,718	33,666	13,959	27,261

Complete figures for 1928 are not at present available, but unofficial returns show imports through the port of Corinto alone to have been nearly 35,184 barrels in 1928, and slightly in excess of 14,660 barrels in the first six months of 1929. These larger imports are due to purchases made for use in connection with railway improvements and paving and road building.

At least 90 per cent of the total amount of cement imported into Nicaragua enters through the port of Corinto, and is consumed in the western section of the country.

Swedish Cement Used

It will be noted from the above table that the local market is dominated by European, and especially German cement. Although the above figures do not show it to be the case, Swedish cement is also entering at present in some volume. Of the small quantity of American cement imported, by far the greater part is white finishing cement, which is bought almost exclusively in the United States, and in which European makers are unable to compete as regards quality. In the case of ordinary portland cement, however, American exporters are unable to compete in price with European manufacturers.

Prices

According to local importers, quotations on American cement are seldom if ever below $.250 per barrel, f.o.b. American ports; to this must be added freight charges of $1.80 from New York, or $1.20 from San Francisco, making the cost at Corinto $3.70 to $4.30 per barrel.

As compared with these prices, the German "Alsen" brand cement, packed in iron drums, is now offered at $2.75 per barrel of 170 kilograms, c.i.f. Corinto. Swedish cement, packed in wooden barrels, is offered at $2.50 to $2.60, c.i.f. Corinto. A Belgian slow-setting cement, said to be suitable for construction and not intended to be subjected to any considerable load, has been imported at even lower cost.

Progress of Rapid-Hardening Cement Creates Need for New Standards

By A. C. BLACKALL
London, England

Though rapid-hardening cement is a comparatively recent introduction, users are already confident that it will do all that is claimed for it, and its popularity is such that already there are thirty mills producing accelerated or high early strength portland cements in Europe and America. As this modern development seems likely to continue wherever mills have at hand the necessary raw materials, it has been urged in many quarters that there will have to be some general basis for the sale and acceptance of these new products. If this is not done it is felt that not only the cement industry, but engineering practice as well, will become involved in far-reaching confusion.

It is true that something has already been done in this direction, but unless all manufacturers fall into line there will not only be uncertainty in the minds of contractors, but certain loopholes will be left of which advantage may be taken by the less scrupulous of Continental manufacturers, resulting in mistrust of a product which seems likely to be of lasting benefit to the engineering industry.

The position at present is that most of the larger European portland cement manufacturers are still turning out two distinct grades of material: the ordinary brands, of which the properties are well known, and which pass the old normal specifications, and the new brand which hardens rapidly and which gives improved strengths at all periods of setting. American manufacturers are also turning out the new product; but, unlike the British makers, American and Continental producers seem to have no agreement, either between themselves or with foreign manufacturers, as to what strengths should be guaranteed or expected from high-strength portlands.

Edwin Eckel considers that the specifications of the Belgian Department of Public Works, issued in the latter part of 1927, were the first official recognition anywhere of the fact that there are new grades of portland cement; and whether this be so or not, an examination of these specifications shows that they subdivide artificial portland cements into three classes: (1) high strength portland cements, (2) normal portland cements, and (3) rapid-hardening portland cements. It is obvious that the names applied to the two first classes are merely used for convenience, since each of the products is of high strength and both of them are quick setting, so that the difference is merely one of degree. The normal cement is required to have a strength of 2,845 lbs. in seven days and 4,267 lbs. in 28 days; the high-strength grade 5,689 lbs. in seven days and 7,111 lbs. in 28 days; and the rapid-hardening 7,111 lbs. in seven days and 7,882 lbs. in 28 days. The requirements as to soundness are, of course, alike for all, and there are certain requirements for fineness which, although differing for each class, are yet of little practical importance, as it would be generally impossible to turn out a thoroughly satisfactory high strength cement unless its fineness were pushed well beyond the requirements of the specifications.

Returns have been collected and tabulated which show that out of eleven brands of Continental manufacture sold as high strength portland cements four easily passed the Belgian Class B requirements, even when tested in plastic instead of beaten mortars. Four others would probably have passed the Class B specifications, and three would have failed to pass those requirements under any circumstances.

All these brands are sold today as special portland cements at prices ranging round about 25 per cent above those of ordinary cement. The brands tested included only French, Swiss, German, and Bohemian cements, and careful tests on adequate samples showed a very noticeable variation in strengths at different periods. One of the best results came from a brand which is a true fused portland cement, and one of the poorest results was obtained from the products of a maker who mixes bauxite with his limestone and clay in the hope of approaching the results of real alumina cement.

A final matter of interest, not revealed in the above tests, is afforded by direct comparison of the normal and high-strength cements made at the same mills. This eliminates differences due to any variation in raw materials and manufacturing practice, and it may be said at once that the comparison shows conclusively the high engineering value of the new portland cements as a class. An average has been prepared from voluminous data which suggests that only at early periods—say, one to three days—the high strength portland cements show compressive strengths about 100 per cent better than the ordinary portland cements turned out from the same mill and that even at the end of a year from 10 to 20 per cent of this excess strength is retained.

Dry mills, particularly those which use cement rock or slag in their ordinary mix, are in a rather difficult position, as in their case the manufacturing costs of the new product will be appreciably higher. In most localities it would probably be cheaper to turn a dry mill over to the manufacture of aluminous cement than to attempt to turn out rapid-hardening or high strength portland, and the future line of development may be in that direction.

Utilization of Gypsum for Retarding Cement Set

Naturally-occurring anhydrite, which corresponds chemically to gypsum without the latter's water of crystallization, has been known for a long time to have a very slow rate of solution in water; much slower than that of gypsum. Recent studies by the United States Bureau of Mines in cooperation with Rutgers University at New Brunswick, N. J., indicate that if naturally-occurring anhydrite is ground fine enough, its rate of solution is of the same order of magnitude as that of gypsum ground to the same degree of fineness.

A sample of anhydrite powder was subjected to air classification, and thereby separated into fractions of the following size distributions: 0 — 3 microns (1 micron = 1/25,000 of 1 inch), 6 — 12 microns, 12 — 24 microns, etc. It was found that the finest fraction, that is, the 0 — 3 micron particles, dissolved at such a rate that the saturation solubility of gypsum was reached in 3½ minutes. These results are of importance in any discussion of the utilization of gypsum containing large percentages of anhydrite for the retardation of the set of portland cement. If the rate of solution of the retarder is one of the controlling factors involved in the set of cement (and it seems probable that such is the case), then it would seem permissible to utilize gypsum containing a large percentage of anhydrite provided this retarder is ground to a sufficient degree of fineness.

North American Makes Large Blast

A 200,000 ton blast of lime rock was made at the North American Cement Corporation quarry at Alsen, New York, on November 29th. Twenty tons of dynamite were used.

MEN and MILLS

Notes from the Field

MacNider Elected President of Northwestern States Co.

Col. Hanford MacNider of Mason City, Iowa, was elected president and general manager of the Northwestern States Portland Cement Company, located at that city, on December 17th.

A. F. Frudden of Hollywood, a director, was elected vice-president, and Willis G. C. Bagley, Mason City banker, treasurer. These officers and Wm. Chamberlain of Chicago; E. C. Frudden of Dubuque, Iowa; M. T. Gunders, Kenyon, Minn.; S. T. McKnight of Minneapolis; Edwin White, of St. Paul; S. L. Lon Wright of Winona, Minn.; and Fred Keeler and Frank J. Hanlon of Mason City, were chosen to the board of directors.

Col. MacNider was previously chairman of the board and treasurer. He is past national commander of the American Legion and former assistant secretary of war. His father, Chas. H. MacNider, was president of Northwestern until his death in October, 1928.

Dewey Portland Annual Sales Conference at Plant

Beginning December 9th, the Dewey Portland Cement Company held a two-day sales conference at the plant, near Buffalo, Iowa. Salesmen of Iowa, Illinois, Minnesota, and Wisconsin, as well as officers of the organization, attended.

Practically the entire first day was spent at the plant and in the evening a banquet was held at a local hotel. Speakers there were E. Tyler of Kansas City, president of the company; H. F. Tyler, first vice-president, and K. P. Ferrell, technical service manager. The meeting was in charge of L. J. Capen, vice president and sales manager.

Six Teams Bowl for Petoskey

A six-team bowling league for its plant employees has been organized by the Petoskey Portland Cement Company at Petoskey, Mich., and the new circuit will bowl once a week. The best men will be given a chance on the team in the city-wide industrial league.

The following was the lineup for the first game, played early in November.

The Clerks (the office crew) with a total score for the first night of 1,778; the Yards, with 1,528 for their total; Mechanics had a total for their first night of 1,625; the Packers ran up a count of 1,430 to open the season; while the Millers had a count of 1,612. The Engineers bowled 1,540 points on their starting evening.

R. D. Cheesman Leaves States for South America

R. D. Cheesman, formerly an engineer for the Peerless Egyptian Cement Company and more recently a consulting engineer at Uniontown, Pa., will leave for Chile, South America, on January 2nd. He has been engaged as engineer by a cement manufacturing firm there.

Onyx Found on Pacific Portland Property

Large deposits of onyx have been located in the hills adjacent to the deserted plant of the Pacific Portland Cement Company at Cement, near Fairfield, California. A San Francisco firm has leased the property and will mine the stone.

Frank Smith Attends Hoover Conference

Frank H. Smith, president of the Portland Cement Association and of the Lawrence Portland Cement Company, represented the association at the building industries conference with President Hoover on November 22nd.

Newhouse Talks on Cement

"High Early Strength Cement" was the subject of an illustrated talk by Ray C. Newhouse before the engineers' society of Milwaukee November 20th.

Dewey Portland Host to Engineers' Club

Members of the Engineers' Club of Clinton, Iowa, were the guests of the Dewey Portland Cement Company, Davenport, on November 13th.

Moffett Studio

Colonel Hanford MacNider

Cement Statistics for November

Relation of Production to Capacity

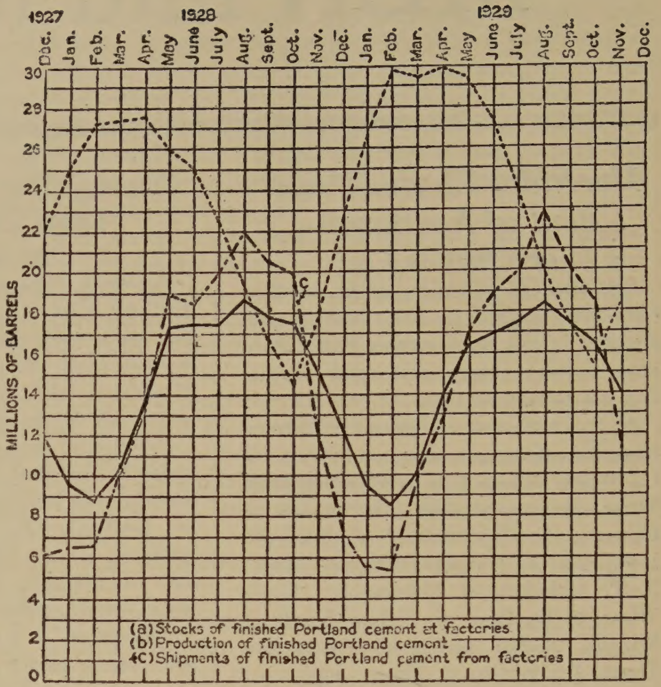
(Figures represent per cent)

	—November— 1928	1929	Oct. 1929	Sept. 1929	Aug. 1929
The month	**77.4**	66.6	77.0	81.8	86.1
The 12 months ended	**74.1**	66.8	67.3	67.5	68.2

Shipments and Production for November Show Losses of 6 Per Cent Against Those for 1928—Totals for Year Lower

NOTE: IN ORDER THAT THE READER MAY KNOW THE TREND AT A GLANCE, THE HIGHER FIGURE, WHETHER FOR EITHER YEAR, UNDER ANY CLASSIFICATION, APPEARS IN SLIGHTLY HEAVIER TYPE.

	1928	1929	Increase or Decrease, Per Cent
Production, November	**15,068,000**	14,036,000	—6.8
Shipments, November	**11,951,000**	11,205,000	—6.2
Stocks at end of Nov.	17,769,000	**18,213,000**	2.5
Total production for year to date	**163,779,000**	158,950,000	—3
Total shipments for year to date	**168,071,000**	163,445,000	—3
No. of plants reporting	159	**165**	



Production, Shipments and Stocks of Finished Portland Cement, by Districts, in November, 1928 and 1929, and Stocks in October, 1929

District	Production—November 1928	1929	Shipments—November 1928	1929	Stocks at end of month 1928	1929	Stocks at end of October 1929*
Eastern Pa., N. J., and Md.	**3,338,000**	2,956,000	**3,153,000**	2,932,000	**4,251,000**	4,024,000	4,000,000
New York and Maine	**962,000**	848,000	725,000	**738,000**	**1,339,000**	1,107,000	996,000
Ohio, Western Pa., and W. Va.	**1,587,000**	1,537,000	1,133,000	**1,197,000**	2,439,000	**2,580,000**	2,240,000
Michigan	**1,409,000**	1,228,000	**811,000**	667,000	1,355,000	**1,636,000**	1,075,000
Wis., Ill., Ind., and Ky.	**1,973,000**	1,760,000	**1,272,000**	1,219,000	1,629,000	**1,869,000**	1,329,000
Va., Tenn., Ala., Ga., Fla., and La.	**1,413,000**	1,085,000	**1,350,000**	1,025,000	**1,683,000**	1,557,000	1,498,000
Eastern Mo., Ia., Minn., and S. Dak.	1,283,000	**1,344,000**	**777,000**	742,000	**1,972,000**	1,876,000	1,273,000
W. Mo., Neb., Kans., Okla., and Ark.†	884,000	**1,176,000**	726,000	**778,000**	**1,150,000**	1,009,000	621,000
Texas	529,000	**661,000**	451,000	**523,000**	424,000	**665,000**	527,000
Colo., Mont., Utah, Wyo.,† and Idaho†	**238,000**	120,000	**145,000**	119,000	398,000	**453,000**	451,000
California	**1,173,000**	1,091,000	**1,103,000**	1,038,000	757,000	**989,000**	937,000
Oregon and Washington	**279,000**	230,000	**305,000**	217,000	372,000	**448,000**	434,000
	15,068,000	14,036,000	**11,951,000**	11,205,000	17,769,000	**18,213,000**	15,381,000

Production, Shipments and Stocks of Finished Portland Cement, by Months, in 1928 and 1929

Month	1928—Production	—1929	1928—Shipments	—1929	Stocks at end of month 1928	1929
January	9,768,000	**9,881,000**	**6,541,000**	5,707,000	25,116,000	**26,797,000**
February	**8,797,000**	8,522,000	**6,563,000**	5,448,000	27,349,000	**29,870,000**
March	**10,223,000**	9,969,000	**10,135,000**	10,113,000	27,445,000	**29,724,000**
April	13,468,000	**13,750,000**	13,307,000	**13,325,000**	27,627,000	**30,151,000**
May	**17,308,000**	16,151,000	**18,986,000**	16,706,000	25,984,000	**29,624,000**
June	**17,497,000**	16,803,000	18,421,000	**18,949,000**	25,029,000	**27,457,000**
July	**17,474,000**	17,281,000	19,901,000	**20,295,000**	22,580,000	**24,525,000**
August	**18,759,000**	18,585,000	21,970,000	**23,052,000**	19,374,000	**20,056,000**
September	**17,884,000**	17,223,000	**20,460,000**	19,950,000	16,799,000	**17,325,000**
October	**17,533,000**	16,731,000	**19,836,000**	18,695,000	14,579,000	***15,381,000**
November	**15,068,000**	14,036,000	**11,951,000**	11,205,000	17,769,000	**18,213,000**
December	12,189,000	....	7,384,000	....	22,918,000	....
	175,968,000	....	175,455,000	....	....	....

*Revised.

†The inclusion of Wyoming begins with April, 1929; of Idaho with June, 1929; of Arkansas with September, 1929.

Mill Equipment

Bishop Contact Cable Continuous Switch

Bishop contact cable, a recent invention for near and remote machine control through an electrical mechanism was one of the exhibits at the recent National Power Show in New York. Bishop Wire and Cable Corporation of New York are the producers.

The invention consists of a waterproof, dustproof and acidproof cable about the size of an ordinary lead pencil, which, when compressed at any point in its entire length, throws a switch, turns on a light, sounds a signal or does innumerable other things which otherwise require direct contact with a button or switch at a given stationary point. In other words, the cable is one continuous switch along its entire length, whether it be fifteen or fifteen hundred feet.

Two conductors, enclosed by the outside insulation, are left bare but separated from each other by an "isolating cushion" of rubber. When pressure is applied the "isolating cushion" yields and permits the outer conductor to contact with a wire which, in turn, is always in contact with the inner conductor, thus closing the circuit. When pressure is relieved the "isolating cushion" returns the outer conductor to its normal position.

Used with a relay switch the Bishop contact cable becomes operative at the point of pressure, wherever the operator happens to be standing.

New S-A Vibrator Power Screen Announced

Stephens-Adamson Mfg. Co. of Aurora, Ill., is now producing the S-A Vibrator, a power actuated screen. The ability to develop positive vibration has been incorporated in this screen as a fundamental feature, the company states. Along with this basic principle, there also has been recognized the necessity of so constructing the machine that it will withstand the constant vibration with no effects detrimental to the life of the equipment.

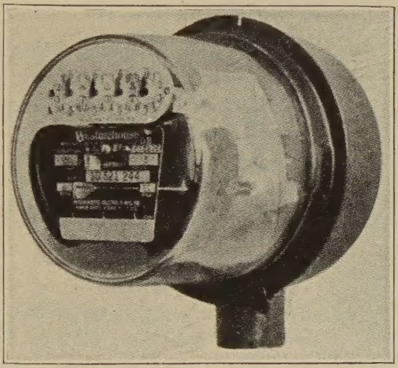
The screens are built in different widths and lengths ranging from two feet wide by four feet long to five deep wide by eight feet long, all available in the single, double and triple deck assemblies. Four different rotor mechanisms are built for installation in the several assemblies selected according to the severity of duty.

Some of the features of importance are claimed by the manufacturer to be positive vibration, grid type screen support, suspended sub-frame, high duty self-aligning ball and roller bearings, pressure lubrication to each individual bearing and adjustable balancing device.

New Westinghouse Detachable Watthour Meter

Detachable watthour meters for use either indoor or outdoor are now available. Westinghouse Electric and Manufacturing Company, E. Pittsburgh, Pa., has designed and put this meter on the market. It consists of the standard temperature-compensated 0B watthour meter housed in a weather-proof case and has these unique advantages, the manufacturer states:

Plug terminals which make installation or removal easy; detachable meters can be plugged into place or removed in a moment like radio tubes.



Suitable for mounting in any location, outdoor or indoor.

Reduces labor, reading and testing costs.

Completely iron-clad and tamper-proof.

Adjustable terminal block which permits mounting the meter with conduit entrance at top, bottom, right or left.

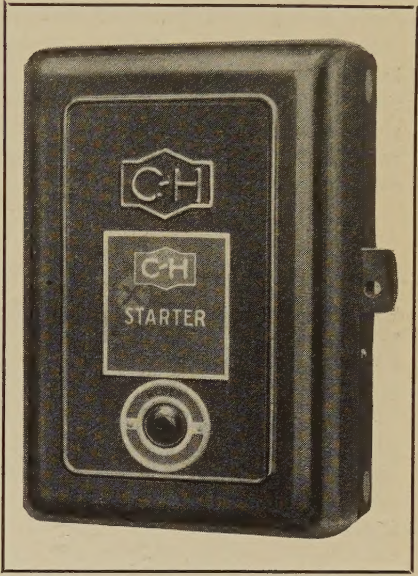
Airveyor Conveying Equipment

The addition of the Airveyor system by the Fuller Company, Catasauqua, Pennsylvania, makes complete its line of unloading and conveying equipment for handling pulverized and crushed materials.

The Airveyor is a bulk-unloading system now being used in handling grain, soda ash, lime and other similar materials. It was acquired from the Guarantee Construction Company of New York by the Fuller Company.

A New D. C. Automatic Starter

A new counter E. M. F. type automatic starter, for small D. C. motors on general applications, is announced by Cutler-Hammer, Inc., Milwaukee, Wis. This small motor starter incorporates a number of new and important features such as: small size, reduced voltage starting, thermal overload protection, low voltage protection and renewable silver contacts. It is rated up to 2 h. p., 115 or 230 volts.



The contactors are designed especially for direct current service and the renewable silver contacts insure long life. Each starter is supplied with a separate push-button master switch providing three-wire remote control. Two-wire control can be furnished if desired.

The starters consist of a main line contactor, an accelerating contactor, an armature resistor, and the thermal overload relays. On depressing the "start" button of the master switch, the main line contactor connects the motor to the line through the armature resistor. As the motor accelerates to the proper point, the counter E. M. F. of the motor armature closes the accelerating contactor which cuts out the armature resistor, connecting the motor across the line.

The standard starter is supplied with thermal overload relays, but starters without the relays are also available. The overload relays are the same as those used in this company's A. C. automatic starters for small motors. They are of the fusible alloy type and can be made applicable to various size motors.

With the Manufacturers

NOTES FROM THE FIELD

Hercules Men Receive New Appointments

An addition to the personnel of the Explosives department is announced by *Hercules Powder Company* with the appointment of *R. B. McKinney* as assistant to the general manager of that department.

Mr. McKinney has been a member of the Hercules organization for 17 years, having been director of purchases since 1918. He will be succeeded as head of the purchasing department by *F. P. H. Sholly*, now assistant director of purchases.

Mr. Sholly has been in the explosives business for 13 years and was formerly assistant general manager of the Aetna Explosives Company when that company was acquired by the Hercules Powder Company in 1921.

Manganese Makes Changes

Manganese Steel Forge Company, Philadelphia, Pa., manufacturers of *Rol-Man* screens and other rolled and forged manganese steel products, announce the following changes in their sales organization:

The company's Cleveland office, formerly located at 623 Union Trust Building, has been discontinued. The territory hitherto served by this office will be handled in the future by *J. H. McKinley*, manager of the Pittsburgh office, 1714 Clark Building.

P. M. Hobbs has been transferred from Cleveland and in the future will have charge of the company's office at 228 N. LaSalle St., Chicago, Ill.

W. H. Potter, former manager of the Chicago office, has been made general sales manager and will henceforth make his headquarters at the main office of Manganese Steel Forge Company, Richmond Street and Erie Avenue, Philadelphia, Pa.

Dixie Machinery Opens Offices

The Dixie Machinery Mfg. Company is opening a Chicago office at 236 North Clark Street, under the supervision of *J. H. Hock.*

Another office has recently been opened at 104 Pearl Street, New York City, where *George R. Horner* is in charge.

H. G. Wright Joins Hardinge

Howard G. Wright, formerly chief engineer of the North American Cement Company, Catskill, N. Y., has joined the staff of the *Hardinge Company* as research engineer in the cement machinery department. Mr. Wright will devote a large part of his time to working up engineering data for the various classes of Hardinge equipment used in cement plants.

T. B. Woods Co. Handles Texrope

To more effectively serve the users of power transmission machinery, the *T. B. Wood's Sons Company*, Chambersburg, Pennsylvania, have been appointed special distributors for Texrope drives by the *Allis-Chalmers Mfg. Company*, Milwaukee, Wisconsin. They will carry a large stock of drives as well as Texrope belts at Chambersburg, Pennsylvania.

Locomotive Works Enlarged

The Fate-Root-Heath Company (Plymouth Locomotive Works), Plymouth, Ohio, manufacturers of industrial and railway locomotives, has just completed a large new factory unit of steel and brick construction.

New equipment, which is now being installed, will double the present output of the Plymouth gear drive gasoline and Diesel locomotives.

Hartley New Chief Engineer

Link-Belt announces the appointment of *J. J. Hartley* to the position of chief engineer of the company's Pershing road plant at Chicago, Ill. He was formerly in charge of foundry equipment sales in the western division of the Link-Belt organization. For the past 19 years he has held various positions with the company, and he brings to the engineering department a vast amount of practical experience coupled with engineering ability.

W. L. Hartley, brother of "J. J." and formerly assistant in the foundry equipment sales department, has been appointed manager of this department to replace his brother.

George Newcomer Dies

George M. Newcomer, formerly of *F. L. Smidth & Company*, died November 28th, at his home in New York City of heart failure.

Mr. Newcomer until his retirement a year ago was first vice-president of the company and had been associated with the latter in that capacity since its inception in 1895.

INDUSTRIAL LITERATURE

Car Dumper Book

Link-Belt Company., Chicago, Ill., has issued a new book describing the Link-Belt rotary railroad car dumper.

This book illustrates the dumper in various positions, and a double page spread points out the main features of its mechanism.

The rotary railroad car dumper described in this book, *No.* 1004, is designed to bring the economies of the lifting type of dumper within the reach of those whose unloading requirements are small.

Detachable Watthour Meters Publication

Detachable watthour meters, Type 0B, for indoor and outdoor use, are fully described in a *Leaflet No.* 20433, recently released by the *Westinghouse Electric and Manufacturing Company*, East Pittsburgh, Pa. The detachable feature of this new meter was developed to facilitate installation, reading, testing and removal. Other features and the operation and construction of these watthour meters are discussed, and a table of approximate weights and dimensions of the sizes of meters listed as standard is given.

Application and detail photographs illustrate the leaflet.

Barbed Plate Type Dust Collector Publication

A four-page bulletin, *No.* 428, prepared by *By-Products Recoveries*, New York City, deals with dry dust collectors, in particular the barbed plate type. Some of the special features are said to be the few moving parts, the simplicity of unit construction, high efficiency on fine dust, and low power consumption.

Crusher Efficiency

The increasing of crushing plant efficiency with Style "B" Newhouse crushers is the subject of a four-page leaflet, *No.* 2116, published by the *Allis-Chalmers Manufacturing Co.*, Milwaukee, Wis.

The features of the crusher, such as unobstructed feed openings, ease of feeding, and handling of large size material are told. Installation and sectional views are shown.